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nothing is known. A French painter, who accompanied Mr. Lambros, succeeded in making copies of a good many of these frescoes, as well as of numerous miniatures, capital letters, etc., and these he intends shortly to publish. No. 5 gives an account of one of Panselinos's frescoes, and is accompanied with a good chromo-lithograph representing the infant Jesus. This infant, if they were not warned by the presence of the cross, most people would certainly take for Heraklê. It is the infant that developed into the Christ of Michael Angelo's *Last Judgment*. If this be a fair specimen of good Byzantine art, Mr. Lambros is certainly justified in claiming for that art more consideration than has hitherto been accorded to it. It would be interesting to know to what extent the early Italian painters were influenced by the works of the now forgotten Byzantine masters.

The subject of No. 6 is sufficiently indicated by its title. The *Περίηγησις* of Laskaris is very brief, occupying only about a page and a half, and describes a visit to the north of Europe in the beginning of the 15th century; that of Batatzis, written in the usual political doggerel and miserably rhymed, gives an account of two voyages made in the first quarter of last century, one to Russia and Persia, the other to various European countries. Neither contains anything of great interest.

In this notice we have not mentioned any of Mr. Lambros' numerous archaeological articles scattered through different periodicals, the *Ἀθήναιον*, the *Ἡερανασσοῦς*, the *Mittheilungen des deutschen archæologischen Instituts in Athen*, etc. In taking leave of so profound and accurate a scholar, we can only express the wish that his valuable activity may be continued for many years, and that he may succeed in making the middle age of Hellenism as interesting as that of Latinism has long been recognized to be.

THOMAS DAVIDSON.

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Griechische Grammatik von GUSTAV MEYER. Leipzig. 1880. Breitkopf und Härtel (Bibliothek Indogermanischer Grammatiken, Band III.)

This book is important from the position which it must hold in the future history of Greek grammar, if for nothing else, for it is the first treatise in which the investigations recently made on Indo-European vocalism are applied to at least two important chapters of Greek grammar; and it may be regarded as an official summary of what has been done in this field up to the time of the appearance of the book. Its completeness, its trustworthiness, and above all the extent to which it affords new light, will necessarily depend upon the degree in which these researches on vocalism are themselves complete and trustworthy. Gustav Meyer is one of the most ardent devotees of these studies, and that too after having clung to older methods up to an astonishingly short time previous to the publication of his grammar. Kuhn's *Zeitschrift*, vol. XXIV, 216 ff., contains an article by him entitled "Ueber den einfluss des hochtons auf den griechischen vocalismus," which is now valuable mostly because it shows how an honest scholar can change his opinions from 1879, the date of the article, to 1880, the date of the book before us.

In the article he seems to ignore completely the grand advances of the preceding four years of investigation. In the grammar he meets views resulting

from the principles of the new school not only in a just spirit, but with something like a friendly eagerness, governed perhaps by the feeling that new light, if it is to be gained on a large scale, is to be gained only by an ardent forward movement. On the other hand he by no means fails to recognize that fresh acquisitions, which have not had time to settle, ought to be used with caution by the author of a grammar which is to represent a language for some time to come, for it is not probable that any one will attempt another treatise on Greek form within the next ten years; and it is, to use the words of the author, a "*periculosae plenum opus aleae* to attempt at this time from a comparative point of view a treatise on any single I. E. language" (preface, p. viii).

Only two portions of Greek grammar are discussed: a "lautlehre" (description and history of the sounds) and a "flexionslehre" (description and history of the inflections). Of these two the first aims to be exhaustive, comprehending all the accessible material of the language; the second restricts itself to the most important phenomena. Just at this time an attempt at a "stammbildungslehre" would be especially interesting. Much has been brought to light in this department lately, especially by Osthoff, Brugman, and Joh. Schmidt, and a systematic treatment by a skilful hand of the facts and principles of "stammabstufung" (strong and weak stems) would no doubt throw light upon many vexed questions of Greek form and sound. This, however, was made impossible by the restriction on the part of the publishers as to the size of the series of I. E. grammars, of which this is one.

The "lautlehre" contains nine chapters, of which the first two are devoted to the vowels. It is here that most of what is new and requires comment is to be found.

The first fact new in a Greek grammar is contained in the statement that *e* and *o* are original sounds and not the result of weakening from an old I. E. *a*. Meyer simply states that this opinion is now generally accepted without attempting to prove it. It will not be out of place to state compendiously what the grounds are.<sup>1</sup>

1. In Greek itself *e* and *o* exchange with one another in the same root in such a way that as a rule *e* appears in one certain set of formations, *o* in another set: *e*. g. γέν-ος, μέν-ος and γέ-γον-α, μέ-μον-α; never \*γον-ος (as an -es-stem) nor \*γε-γεν-α. The variation between *e* and *o* is therefore an organic one, and the two sounds cannot be the result of phonetic corruption from *a*.

2. The appearance of Sk.-Iranian *a* for Greek and European *e* and *o* (North-European *a*), which gave rise to the assumption that all of these came from an original I. E. *a*, is now deprived of its importance by two facts: first, that the Armenian (an Iranian language) shares the *e-o* with Europe; secondly, that the traces of a phonetic value much the same as that of Greek *e* has been found under the cover of this Sk. *a*, for only on this supposition can the change of certain gutturals into palatals before it be accounted for.<sup>2</sup>

The theory of *guṇa* has been given up; the consequence is roots of the form *ās, âi, srâu, bhâr, mân, dâik, dârk, bhândh* (εσ, ει, σρεν, φερ, μεν, δεικ, δερκ, πειθ). Formerly the roots were inconsistently set down as εσ, φερ, μεν, δερκ,

<sup>1</sup> For the literature bearing upon this question see this Journal, vol. I, p. 281.

<sup>2</sup> Cf. this Journal, vol. I, p. 301 ff.

πειθ, but ι, σρν, and δικ, thus allowing the ε a function in the one case and denying it the same in another which is perfectly parallel. These roots have in addition to the form with ablaut *ā* (Greek ο: οι, δορκ, ποιθ, etc.) a weak form, which differs from the strong by the lack of this ε (ο): σ, ι, σρν, φρ, μν, δικ, δρκ, πνθ. This reduced form may safely be assumed to have stood originally only in formations which had the word-tone on some non-radical syllable,—thus naturally bringing about a less distinct pronunciation of the root-syllable. The graphical representation of this weakened utterance is *root minus the ε-o-vowel*.

The recognition of these weak root-forms leads irresistibly to the assumption of *I. E. lingual and nasal vowels (liquida and nasalis sonans*, Sievers' *Grundzüge der Phonetik*, p. 28 ff); *I. E. ʔ, (.), ʔ, ʔ* represented in Greek by *ap* or *pa* (*aλ* or *λa* for the lingual and *a* and *av*, *a* and *am* for the nasal vowels; cf. *Jenaer Literaturz.* 1877, p. 735; this *Journal*, vol. I, 292 ff).

Strange in external appearance are the *I. E.* and *Gr.* groundforms or explanatory symbols which are the result: *τη-ννμαι* for *τάννμαι*; *σι-σλ-ιω*<sup>1</sup> for *ιάλλω*; *\*βη-ιω* for *βαίνω* = *venio*. In order to explain *άσκει· βλάπτει* (Hesych.) a groundform *\*Fv-σκεi* is to be assumed, as for *\*άa-τός* in *ά-άτος* ("unhurt") *\*Fη-τός* = Germ. *vun-d(a)-s*. In both these forms *a* is prothetic before the *F*, which has been lost; the strong form of the root is *Fev* = Ved. *van* in *ván-atī*; he conquers, RV. Striking is the explanation of *-φασσα* in *Περσέφασσα* (*Περσεφόνη*). *\*Φασσα* is an old participle from a root-verb (non-thematic conjugation); groundform *\*φη-τ-ια* from a root *φεν* (more correctly *θεν*; all three root-forms: *θεν*, *φον*, *\*φν*; K. Z. xxv, 168) = Sk. *hatī* for *\*ghn-t-i*; so also *πρό-φρασσα* for *\*προ-φρητ-ια*. Further, *\*rñghra* for *ἐλαφρός* (ε prothetic); *\*nsmā* or *\*msma* for Lesbian *ἄμμε* for *\*ασμε*; cf. Sk. stem *asmā-*, Germ. *uns*. The Greek groundform for *ἐθάράτο* would be *\*ε-φθρ-ντο*; *\*ηλ-μ* the predecessor of *ἦτα*.

It certainly does not seem as though one of the acquisitions of the grammatical science of to-day were simplicity of method in representing its processes. We will, however, gladly put up with a cumbrous system of symbols if we are compensated for it by exactness—if such symbols help to convey to the reader the exact meaning of the writer. This quality the signs, which may be gleaned from the examples above, in general possess to a high degree. When we examine the symbol-group *\*nsmā* there can be no doubt as to the exact value represented by it: *ns-* is a syllable in which the element that carries the syllable tone is in the main nasal (a nasal vowel). The vocalic color of this nasal vowel the symbol does not undertake to express, and it is indeed unknown. The representations of it in the various languages of the family diverge widely: *Gr.* and *Sk.* *a* and *an*; but Germ. *un*, Lat. *en*, Lithuanian *in*, Old Bulgarian *ε*. In the same way *ʔ* is an element mainly of a lingual character, bearing the tone of the syllable; in the rendering of it the *Sk.* at least coincides with the symbol (*Sk.* *ʔ*); the other languages again vary greatly: Zend *ērē*; *Gr.* *ap* and *aλ*; Lat. and Germ. *or(ur)*; Lith. *ir*; Old Bulg. *ri*; Old Irish *re*.<sup>2</sup> The remainder *mā* is practically identical with *Gr.* *με*. The symbol does not, however, profess to

<sup>1</sup> *ī* is Sievers' designation for semivocalic or semiconsonantal *y* in distinction from the full consonant (spirant) *y*; *Phonetik*, p. 123. The same is true for *ʔ*, etc., employed further on.

<sup>2</sup> Windisch, *Kurzgefasste Irische Grammatik*; pref. V; Zimmer K. Z. XXIV, 209.

define the value of the I. E. vowel, which it renders, quite so closely;  $\hat{a}$  expresses a vowel sound lying somewhere between  $e$  and  $a$ , but without quite reaching  $a$ ; in the same way  $\hat{o}$  is a sound between  $o$  and  $a$ , which does not quite reach  $a$ . Nevertheless it is becoming more and more common to write simply  $e$  and  $o$  for  $\hat{a}$  and  $\hat{o}$  even at the expense of perfect exactness.

The work which the discovery of the I. E. lingual and nasal vowels has done must be admitted to be great. They have bound together firmly much that was indeed felt to belong together; but could not be proved to do so, because the phonetic laws which would allow the union could not be formulated. The entire work of Meyer is studded with striking and convincing etymologies and with lucid explanations of the phenomena of formation. The ending of the accusative singular is  $m$ ; no other more complicated form is now needed to explain any I. E. accusative. This  $m$  appears unchanged in vocalic stems  $\lambda\acute{o}\gamma\omicron-\nu$ ,  $\pi\acute{o}\lambda\iota-\nu$ ,  $\sigma\ddot{u}-\nu$ ; after consonantal stems the same  $m$  becomes vocalic  $\bar{m}$  ( $a$ ):  $\pi\acute{o}\delta-\alpha$ ,  $\phi\acute{\upsilon}\lambda\alpha\kappa-\alpha$ ,  $\eta\gamma\epsilon\mu\acute{o}\nu-\alpha$ . When we find forms like  $\iota\chi\theta\ddot{\upsilon}-\alpha$ , etc., they are later formations made with the ending  $a$  abstracted from combinations where it was legitimate. In the same way the Homeric endings of the third person— $-αται$ ,  $-ατο$ —find a perfect explanation; see §19.

Interesting is the effect which the assumption of nasal vowels has in case of the root of the Gr. word for 'one'; the root is  $sem$ ; it appears in Lat.  $sem-el$ ,  $sim-plex$ ,  $sin-guli$  and  $sin-cinia$  ('cantatio solitaria'); the Gr.  $*σεμ$  appears regularly as  $εις$  ( $=*\acute{\epsilon}\nu-\varsigma$  for  $*\acute{\epsilon}\mu-\varsigma$ ). Supposing that the root-vowel of  $sem$  falls out there remains a sound-group  $sm$ , which can remain unchanged before vowel-endings: thus we have the fem.  $\mu-\acute{\iota}\alpha$  for  $*\sigma\mu-\acute{\iota}\alpha$ ; before consonants the  $m$  of  $sm$  must turn sonant:  $sm = Sk. sa = Gr. \acute{a}$ ; so  $\acute{a}-\pi\alpha\zeta$ ,  $\acute{a}-\pi\lambda\acute{o}\varsigma$  and Sk.  $sa-k\acute{y}t$  are satisfactorily laid aside; the Doric and Cretan form  $\acute{a}-\tau\epsilon\rho\omicron\varsigma$  for  $\acute{\epsilon}-\tau\epsilon\rho\omicron\varsigma$  (also appearing in Attic in crasis:  $\theta\acute{\alpha}\tau\epsilon\rho\omicron\nu$ ) is in the same manner  $=*\sigma\mu-\tau\alpha\rho\alpha$ ; a genuine etymon for the word is thus gained. Further, the best acquisition is a beautiful comparison between Sk.  $sahasra$ , Zd.  $haza\ddot{h}ra$  and the Gr. word for 'thousand,'  $sa-hasra$  is  $smi-hasra$ , 'one thousand';  $-hasra$  is identical with the stem  $\chi\acute{\iota}\lambda\omicron-$  (for  $\chi\epsilon\acute{\iota}\lambda\omicron-$ ,  $\chi\epsilon\sigma\lambda\omicron-$ ) in Homeric  $\delta\epsilon\kappa\acute{\alpha}\chi\acute{\iota}\lambda\omicron\iota$ ,  $\acute{\epsilon}\nu\acute{\nu}\alpha\chi\acute{\iota}\lambda\omicron\iota$ ; the Lesbian form  $\chi\acute{\epsilon}\lambda\lambda\omicron\iota$  for  $*\chi\epsilon\sigma\lambda\omicron\iota$  is the same  $-hasra$  extended to  $hasra$  (§406). Finally the  $\acute{\epsilon}$ - of  $\acute{\epsilon}-\kappa\alpha\tau\acute{o}\nu$  is identified with this  $sm$ ;  $\acute{\epsilon}-\kappa\alpha\tau\acute{o}\nu$  stands for  $*\acute{a}-\kappa\alpha\tau\acute{o}\nu$ ; this appears in the Tegean  $\tau\pi\iota-\alpha-\kappa\acute{\alpha}\sigma\iota\omicron\iota$  and in the Doric and Boeotian  $\delta\iota-\alpha-\kappa\alpha\tau\acute{\iota}\omicron\iota$  (§405). These combinations seem all sound; but even if some of them should not stand the test of time, we believe that on the whole the method which underlies them betokens a deeper insight into the morphology of I. E. words than could ever be attained by conservatively clinging to the results of the older masters: Bopp, Schleicher, Curtius, etc.

The new school follow Schleicher in treating the vowel-phenomena in 'reihen,' 'vocalreihen,' an expression, which like many Germ. grammatical terms, can be rendered but inadequately into English by 'vowel-series.' The phenomena which have just been considered all enact themselves in the  $\acute{a}$ -reihe; parallel with the three vocalic forms which this offers (form with  $\hat{a}$ , form with  $\hat{o}$ , and form without this  $\hat{a}$ - $\hat{o}$ ) there appear three other series—the  $\bar{e}$ -series:  $\bar{e}$ ,  $\bar{o}$ ,  $\bar{\bar{e}}$  (§37), the  $\bar{a}$ -series:  $\bar{a}$ ,  $\bar{o}$ ,  $\bar{\bar{a}}$  (§43), and the  $\bar{\delta}$ -series:  $\bar{\delta}$ ,  $\bar{o}$ ,  $\bar{\bar{\delta}}$  (§71), justifying the following proportion for the Greek:

TABLE I.

$\varepsilon$ -series	:	$\varepsilon$	:	$o$	:	$—$	$=$
$\eta$ -series	:	$\eta$	:	$\omega$	:	$\varepsilon$	$=$
$\bar{a}$ -series	:	$\bar{a}$	:	$\omega$	:	$\bar{a}$	$=$
$\omega$ -series	:	$\omega$	:	$\omega$	:	$o$	

An example of the  $\eta$ -series is presented by:  $\tau\acute{\iota}\text{-}\theta\eta\text{-}\mu\iota$ ,  $\theta\omega\text{-}\mu\acute{o}\text{-}\varsigma$ ,  $\tau\acute{\iota}\text{-}\theta\epsilon\text{-}\mu\alpha\iota$ ; of the  $\bar{a}$ -series by:  $\phi\eta\text{-}\mu\acute{\iota}$ ,  $\phi\omega\text{-}\nu\acute{\eta}$ ,  $\phi\alpha\text{-}\mu\acute{\epsilon}\nu$ ; of the  $\omega$ -series:  $\delta\acute{\iota}\text{-}\delta\omega\text{-}\mu\iota$ ,  $\delta\acute{\epsilon}\text{-}\delta\omega\text{-}\kappa\alpha$ ,<sup>1</sup>  $\delta\omicron\text{-}\tau\acute{o}\varsigma$ . It is to be noted that the material for the middle ablaut is very fragmentary in the  $\eta$ - and  $\bar{a}$ -series (§§40, 41, 45, 49), a fact which is explained by assuming far-reaching assimilations in favor of the first ablaut. In order to understand precisely the origin of these series, *i. e.* the method which led to their recognition, it will be necessary to refer to a theory which as far as can be seen emanates from Brugman, and has been most extensively employed by De Saussure, a pupil of his, in his 'Mémoire sur le système primitif des voyelles dans les langues indo-européennes.'

NOTE ON THE THEORY OF SONANT COEFFICIENTS.<sup>2</sup>

The very life of this theory is the assumption that all I. E. roots can have but one vowel:  $\acute{a}$  ( $e$ ) varying with  $\bar{a}$  ( $o$ ); all other seemingly vocalic elements are in reality semiconsonants, which assume the function of vowels only when this  $e$ - $o$  has for some reason been lost ( $\kappa\lambda\acute{\epsilon}\text{-}\text{F}\text{-}\omicron\varsigma$ ,  $\kappa\lambda\nu\text{-}\tau\acute{o}\varsigma$ ); this semiconsonant is called 'sonant coefficient' (coefficient sonantique). In cases where the root does not possess such a sonant coefficient it remains vowelless ( $\pi\acute{\epsilon}\tau\text{-}\omicron\mu\alpha\iota$ :  $\acute{\epsilon}\text{-}\pi\tau\text{-}\acute{o}\mu\eta\nu$ ;  $\acute{a}\text{-}m\acute{\iota}$ :  $s\text{-}m\acute{a}\varsigma$ ). This agrees incontrovertibly with all the facts in the case of roots of the  $\bar{a}$ -series;  $\pi\epsilon\tau$ ,  $\delta\epsilon\iota$ ,  $\chi\epsilon\nu$ ,  $\delta\epsilon\rho$ ,  $\sigma\tau\epsilon\lambda$ ,  $\mu\epsilon\nu$ ,  $\lambda\epsilon\iota\pi$ ,  $\acute{\epsilon}\lambda\epsilon\nu\theta$ ,  $\delta\epsilon\rho\kappa$ ,  $\pi\epsilon\nu\theta$ , etc., can interchange with  $\pi\omicron\tau$ ,  $\delta\omicron\iota$ , etc., but only upon the loss of this  $e$  or  $o$  do the semiconsonantal elements contained in these roots assume the function of vowels:  $\delta\iota$ ,  $\chi\nu$ ,  $\delta\rho$ ,  $\sigma\tau\lambda$ ,  $\mu\nu$ ,  $\lambda\iota\pi$ ,  $\acute{\epsilon}\lambda\nu\theta$ ,  $\delta\rho\kappa$ ,  $\pi\rho\theta$ , etc. The possible sonant coefficients of roots of the  $\bar{a}$ -series are accordingly:  $i$ ,  $u$ ,  $r$ , ( $l$ ),  $u$ ,  $m$ , and if we add these to the real vowels of the  $\bar{a}$ -series we obtain the following five (or six) series within the  $\bar{a}$ -series:

TABLE II.

$\epsilon\iota$	:	$\omicron\iota$	:	$\iota$	$=$	$(\epsilon\lambda$	:	$\omicron\lambda$	:	$\lambda)$	$=$
$\epsilon\nu$	:	$\omicron\nu$	:	$\nu$	$=$	$\epsilon\nu$	:	$\omicron\nu$	:	$\nu$	$=$
$\epsilon\rho$	:	$\omicron\rho$	:	$\rho$	$=$	$\epsilon\mu$	:	$\omicron\mu$	:	$\mu$	$=$

In Greek the roots made according to these models are about 250 (Journal, vol. I, p. 310), and we consider it not unsafe to state that more than one-half of the roots which occur in verbal formations are of this class. In the other languages also these roots are preponderatingly represented (*e. g.* Sk. and Gothic). The thought then that the remaining roots also may be found constructed on the same plan does not lie far removed, and Saussure boldly makes the attempt: As in table II,  $\iota$ ,  $\nu$ ,  $\rho$ , ( $\lambda$ ),  $\nu$ ,  $\mu$  are the sonant coefficients to  $\epsilon$ - $o$ ; as these are

<sup>1</sup> M. and Brugman regard this word as coming from a root  $\delta\omega\kappa$ :  $\delta\acute{\epsilon}\text{-}\delta\omega\kappa\text{-}\alpha$ ; see below and § 557.

<sup>2</sup> Saussure, p. 134 ff; for reviews cf. Misteli; Lautgesetz und Analogie, Zeitschrift für Völkerpsychologie, Vol. XII, fasc. 4. Fick in Göttinger Gelehrte Anzeigen, stück 14; April 7th, 1880.

forced in the reduced root-form to play the part of vowels ( $\iota$ ,  $v$ ,  $\rho$ , ( $\lambda$ ),  $\nu$ ,  $\mu$ ), so in table I  $\epsilon$  of the  $\eta$ -series is a sonant coefficient ( $\epsilon$ ), which is performing the function of a vowel, because the real root-vowel  $\epsilon$ - $o$  has been lost; *i. e.*  $\eta$  stands or  $\epsilon\epsilon$ :  $\omega$  for  $o\epsilon$ ; in the same way the vocalism of the  $\bar{a}$ -series goes back to  $\epsilon\bar{a}$  for  $\bar{a}$ ;  $o\bar{a}$  for  $\omega$ , and  $\bar{a}$  is the sonant coefficient; so also the  $\omega$ -series is to be resolved into  $\epsilon o$ ,  $oo$  and  $o$ . We could then add to table II three perfectly parallel series:

TABLE III.

$\epsilon\epsilon$	:	$o\epsilon$	:	$\epsilon$	=
$\epsilon a$	:	$o\bar{a}$	:	$a$	=
$\epsilon o$	:	$oo$	:	$o$	

From the standpoint of the phonetist we believe there is no objection to be urged:  $\epsilon$ ,  $a$  and  $o$  can be 'consonants' as well as  $\iota$  and  $v$  (Sievers, *Phonetik*, p. 123); the contractions with the root-vowels into the vowel-forms actually occurring would also pass criticism, though it is to be noted that in the first perpendicular column of table III the *semiconsonantal* elements impress their vocalic color on the result ( $\epsilon\epsilon$ ,  $\epsilon a$ ,  $\epsilon o$ :  $\eta$ ,  $\bar{a}$ ,  $\omega$ ), while in the second perpendicular column the semiconsonantal element succumbs, and the result of the contraction ( $\omega$ ) has the *vocalic color of the real root-vowel* ( $o$ ).

One cannot but admire the ingenuity and dash, the mental 'chic' which underlies these investigations; but from the standpoint of the history of the I. E. languages we must refuse for the present to accept their results. No one language shows even a single instance in which the elements supposed to underlie the contraction occur uncontracted. This to be sure is no final condemnation; we are becoming accustomed more and more to view the immediate historic background of the separate I. E. languages,—the I. E. parent language, as a real language devoid of unnatural regularity, presenting in many respects phenomena of a very secondary nature—phenomena which had a long history before them, and the possibility of these contractions must not be absolutely denied. Practically, however, they cannot as yet be recognized in that form.

But one result this theory has yielded, and this Meyer has incorporated, namely, the recognition of the fact that the  $\eta$  and  $\bar{a}$  of the  $\eta$ - and  $\bar{a}$ -series vary with  $\omega$  under the same circumstances under which  $\epsilon$  varies with  $o$ . Meyer does not state the same principle outright for the  $\omega$ -series, perhaps because it there loses all practical value, since the first two ablauts fall together in  $\omega$ . No doubt it would have been better in spite of the slender material to recognize and state distinctly that the  $\omega$  of  $\delta\iota$ - $\delta\omega$ - $\mu$  is to the  $\omega$  of  $\delta\epsilon$ - $\delta\omega$ - $\kappa\alpha$  (or  $\delta\delta\omega\delta\alpha$ ) what the  $\bar{a}$  of  $\phi\bar{a}$ - $\mu$  is to the  $\omega$  of  $\phi\omega$ - $\nu\eta$ , and the  $\epsilon$  of  $\lambda\epsilon\iota\pi$ - $\omega$  to the  $o$  of  $\lambda\epsilon$ - $\lambda o\iota\pi$ - $a$ . If the ablaut is assumed for all other series, the mere fact that in one series the two vowel-forms coincide can furnish no reason for ignoring the existence of the same principle there.

Extremely interesting will it be now to see what vocalic and semivocalic material is furnished by the exposition of Meyer for the I. E. parent speech.

The  $\bar{a}$ -series yields two real vowels:  $\bar{a}$  and  $a$  ( $\epsilon$  and  $o$ ) and the following sounds wavering between consonantal and vocalic function:  $y$  and  $i$ ;  $v$  and  $u$ ;

*r* and *r̄* (*l* and *l̄*); *n* and *n̄*; *m* and *m̄*.<sup>1</sup> Its diphthongs would be: *ei, oi, eu, ou* (in a wider sense of the term also *er, or (el, ol)*; *en, on*; *em, om* and even *eñ, oñ*; *eñ, oñ*).

The *ē*-series yields: *ē* and *ē<sup>1</sup>* (so designated to differentiate it from the *ē*'s of the two following series) and *e*.

The *ā*-series yields: *ā* and *ā<sup>2</sup>*; and *a*.

The *ō*-series yields: *ō<sup>3</sup>* and *ō<sup>4</sup>* and *o*. Of diphthongal material, in which the first part is a long vowel there appears certainly at least: *āu* in the stem *nāu*-; Ionic (not pan-hellenic) *νῆυ-ς*; Sk. *nāu-s* (Whitney 361, a); Lat. *nāv-is*; Sk. *gāu-s* probably is to be referred to an I. E. stem *gōu*-.

Thus far we have seen nothing of the I. E. *ā*, which formerly played so great a role in I. E. grammar. The *a* which appears as the weak root-form in the *ā*-series has too special and doubtful a character to allow one to assert definitely that it was originally a pure short *a*-vowel (cf. *στᾶ-τός*=Sk. *sthi-tās*); on the other hand a quantity of material containing short *a*-vowels, which cannot be arranged in any of the four series, is collected by the author in § 57; material containing the diphthongs *ai* and *au* in §§ 104-5. Much that is to be found there lacks clearness; very few forms have corresponding ones in several languages of the family.

We subjoin a provisional scheme of I. E. vowels and semivowels, claiming neither absolute correctness nor scientific symmetry in the symbols employed. It will, however, suffice to give a fair idea of what Meyer supposes to be the material contained by the immediate predecessor of the separate languages of our family:

Pure short vowels	: ē — ö; ä
Their diphthongs	: ei — oi; ai
	eu — ou; au
Long vowels	: ē — ē <sup>1</sup>
	ā — o <sup>2</sup>
	ō <sup>3</sup> — (o <sup>4</sup> )

Short vowels or semivowels corresponding to these: *e, a, o*.

One diphthong: *āu*

Semiconsonants: *y-i*; *v-u*; *r-ṛ* (*l-l̄*); *m-m̄*; *n-n̄* (*ñ-ñ̄*; *ṇ-ṇ̄*).

Compare this with a scheme that would perhaps represent the average opinion of scholars before the vocalic investigations!

Short vowels	: a, i, u
Long vowels	: ā, (ī), (ū)
Diphthongs	: ai, au
Semiconsonants	: y, v

The semiconsonantal character of linguals and nasals was not recognized in the sense that it is now; and *r, m, n*, etc., according to the older opinion belong to the consonants entirely.

It will be seen throughout that there is no hesitation on the part of the younger grammarians of to-day to postulate for the I. E. parent-language all the fulness of sound-material which a language of historical times possesses. So

<sup>1</sup> One might fairly add the nasals corresponding to the two I. E. guttural series, which could be designated by *ṇ* and *ṇ̄*; and *ṇ̄* and *ṇ̄*; Sk. *bhrāṇāṭe*: *bhraṇāṭs* contain *ṇ* and *ṇ̄*; Zend *renjista-*: Sk. *ragh-ū-*, *ḗλαχ-ύς*, Germ. *lang-er* contain *u* and *ṇ̄*.



Meyer (§ 216) following Sievers adds to the semiconsonant *i* an I. E. *y*, a spirant and a full consonant, *i* in the beginning of a Greek word is represented by spir. asper; *y* by ζ: ἄζ-ομαι: Sk. root *yaj*; and ζῆμα: Sk. root *yam*; the difference between the Gr. initials reflects itself in the different treatment of the two Sk. roots when reduplicated: *i-yáj-a* but *ya-yám-a*; for a similar opinion pronounced more hesitatingly with regard to a difference between initial semiconsonantal *u* and *v*, a spirant consonant, see § 242.

The change in principle which is illustrated by all this amounts to the following: There is a perfect willingness to-day to believe that the parent speech was a language furnished with all the riches and all the defects of historical languages. We are not acquainted with any attempt to explain forms of that language by that much-employed factor in the grammatical investigations of to-day, namely 'false analogy,' 'form-association'; but it is interesting to see that I. E. *irregularities* are being recognized more and more. Every one will at once think of κεί-ται=Sk. *cé-te*=Zd *čā-tē*, irregular in that it has a strong root-form, accompanied by the tone on the root-syllable, in the middle voice of a root-verb; the same irregularity is probably to be seen in ἦσ-ται=Sk. *ās-te*; the adjectives ὠκ-ύς and ἥδ-ύς=Sk. *āc-ús* and *svād-ús* having the tone on the suffix are irregular in showing a strong root-form; cf. θρασ-ύς=Sk. *dhṛśh-ús*; βραδ-ύς=Sk. *mṛd-ús*; γλυκ-ύς: γλεῦκ-ος, etc.; from other languages one need but mention *ma-tis*: *gd-tis*, where the tone of *gd-tis* is irregularly on the root; this difference of accent reflects itself perfectly in Gothic (*ga*)-*mun-d(i)s*: (*ga*)-*qum-ri(i)s*, which are according to Verner's law: -*mun-dis* but -*qum-pis* in perfect correspondence with the irregularity of the Sk., we have here therefore an I. E. irregularity. Much more material of this character could be added, and facts of this kind are well fitted to make the acceptance of an extensive and complicated system of I. E. sounds seem less hazardous and perhaps more in accordance with genuinely sound and sober views of language, than were the unnaturally simple systems, established by the older grammarians; the results of an undue prepossession in favor of the phenomena of the Sanskrit.

Totally changed as the treatment of the vocalism of Greek appears in Meyer's treatise, little that is new in principle can be found in the treatment of the consonants. Here we find the author in all important particulars on the same ground with older comparative treatises. Truly comforting it is to find the formerly large chapter on Greek metathesis reduced to two paragraphs (173-4); this is due to the recognition of the fact that I. E. *r* (?) appear in Gr. indifferently as *ap* or *pa* (*aλ* or *λα*). The treatment of the two guttural series also offers nothing that is very new, except the identification of Gr. *dentalism* with the specially Aryan (Sk.-Zd.) *palatalization*; the author follows Joh. Schmidt and Collitz (cf. Journal I, 301 ff.). Very happy is the device by which the different character of the two series is indicated without resorting to the usual method of differentiating them by numbers or diacritical marks (§ 184 ff.).

The most important new factor which has been added to the knowledge of Greek *form* and *inflection* is the recognition of the variableness of stems within the same formation, much the same in principle as in Sk., the Germ. '*stammabstufung*.' This acquisition has a thorny side on Gr. ground; for the variableness of stem is in general preserved only in faint remnants; it has been wiped away by assimilations to and fro; these assimilations were rendered easy

because the old accentual law, so far the only known ground for a large part of this phenomenon, is superseded by the enclitic accentuation (the recessive accent). There is no distinct attempt in the book to give a survey of the stems, which are subject to the laws—there being no chapter on stem-formation—but in the course of treating the case-endings and the present stems, much that is keen and suggestive appears. We cull but a few examples:

Doric *πῶς* : *ποδ-ός* is reflected in Sk. *ṛāḍ-am* : *ṛad-as* ; cf. *φρήν* : *φρα-σι* (Pindar).

Ποι-μήν : ποι-μέν-ος : ποί-μν-η : Sk. *ṛāj-ān-am* : *ṛāj-nas*, *πα-τέρ-α*, *πα-τρ-ί*, *πα-τρά-σι* : Sk. *ṛi-tár-am*, *ṛi-tr-ā*, *ṛi-tṛ-shu* ; *αἰήρ* : *ἀνδρ-ός* : Ved. *ndr-am*, *nṛñ*.

*εἰδ-ῶς*, *εἰδ-ῶτ-ος*, *ἰδ-υ(σ)-ῖα* : Sk. *vid-vāñs-am*, *vid-vdt-su*, *vid-úsh-i*.

*εὐ-μεν-ής*, *μέν-ος*, *μέν-ε(σ)-ος* : Sk. *su-mān-ās*, *mān-as*.

*εἰ-μι*, *ἰ-μεν* ; *φᾶ-μί*, *φᾶ-μέν* : *ἔ-μι*, *ἰ-mds*.

*τί-θη-μι*, *τί-θε-μεν* : Ved. *bi-bhār-mi*, *bi-bhṛ-māsi*.

*ἐ-βη-ν*, *βᾶ-ῖην* : Ved. *á-ḥro-t*, *ḥru-tām*.

*ἐ-οικ-α*, *ἐ-ικ-τον* : Sk. *bi-bhéd-a*, *bi-bhid-ús* : Goth. *staig-stig-um*.

*ἵπ-πος*, *ἵπ-πε* : Old Lat. *eq-uos*, *eq-ue*.

Doric *ἐχ-ο-ντι*, *ἐχ-ε-τε* : Old Lat. *veh-o-nt*, *veh-i-te* : Goth. *vig-a-nd* : *vig-i-p*.

The chapter on 'stammabstufung' will probably always remain a dark one within the precincts of the Greek. Especially in the case of noun stems it may be assumed—considering the fragmentariness of the material—that the reconstruction of more ancient conditions will always remain subjective opinion, rather than convincing fact. Sufficient is the gain from these investigations if they only show, first that the striking phenomena of Sk. in this direction are paralleled extensively in Europe, secondly that the Greek stem-formations of historical times are secondary in this respect.

New in a Greek grammar is the view emanating from Scherer and now generally accepted, that the Greek distinction between *ω*- and *μ*- verbs (*φέρω* : *τί-θη-μι*) is original and the Sk.-Zend *bhār-ā-mi* has borrowed its *mi* from forms that possessed it legitimately, *e. g.* *dā-dhā-mi* ; cf. Goth. *baír-a* : *i(s)-m(i)*. This is one of the many examples which illustrate the growing tendency to suspect the originality of Sk. forms.

Finally the new explanation of the *κα*- perfect should be noted, both for its own sake and because it illustrates most forcibly the views which are held by some scholars with regard to the extent to which 'false analogy' may be found doing work in language. Compare upon this point the instructive essay of Misteli in Volumes XI and XII of the *Zeitschrift für Völkerpsychologie*. The *κα*- perfect is explained by Brugman (K. Z. XXV, 212 ff.)—Meyer hesitatingly accepts the explanation—as due to one single perfect *δέδωκα*, where, he claims, *κ* belongs to the root (*δωκ*=Sk. *dāṇ*) ; this *δέ-δωκ-α* was afterwards felt by the language-users to belong to root *δω* ; *i. e.* *δε-δω-κα* instead of *δε-δωκ-α*, and this is the origin of the suffix *κα*. To be sure this root *δωκ* is decidedly problematic on Greek ground (a doubted present *δῶκω* on the Cypriot inscription of Idalion is the only proof) and the meaning of the root *dāṇ* ('to reverence,' 'to bring offering') is also unfavorable to an identification with it, but this does not deter Brugman ; he still prefers this to the old explanation, which, it must be granted, rather arbitrarily assumes that a special stem in *κα* lies at the bottom of the formation. The view of Brugman and Meyer has nothing convincing ; it is, however, a sign of the times. Explanations of difficult forms will in the imme-

diate future be made on the same supposition of analogy working in this extraordinary if not morbid way. Leskien in his lectures on Lithuanian explains the second person singular of the present, perfect, future, etc., of all Lithuanian verbs—they end in *i*: *suki*, *sukai*, *sùksi*—as *due to the analogy of the single form esi*, second person of *esmi*=Sk. *asi*, etc. Osthoff (K. Z. XXIII, 327) explains the infinitives in *-σθαι* as having originally only the ending *-θαι*=Vedic *dhyai*; that those verbs, which show a radical *σ* on being connected with the ending, *e. g.* *ἦσ-θαι*, *πε-πεῖσ-θαι*, etc., gave rise to the feeling that the ending was really *-σθαι* (*ἦ-σθαι*, *πε-πεῖ-σθαι*) and according to this misconception the entire infinitive in *-σθαι* was built up (*λέγεσθαι*, *φέρεσθαι*, etc.) The great danger of such explanations is that they are uncontrollable, and that they open out unlimited possibilities for other uncontrollable explanations. One cannot disprove them; the possibility of such processes must be admitted; one case in which a few single forms have given rise to a distinct category of formation in German, Latin, Sanskrit, etc., may be fairly said to be lifted above doubt. The type of Gothic *bēr-um*: *bar*; Latin Pf. *lég-imus*: Gr. *λέ-λογ-α* (Hesych.); Sk. *ten-imá*: *ta-tán-a*, which is richly represented in each of these languages, owes its existence to a few single forms, in which this contracted weak perfect-form was due to a phonetic process: *e. g.* Gothic *sēt-um*: *sat*; Lat. *sēd-imus* to a lost *\*se-sod-i*; Sk. *sēd-imá*: *sa-sā-d-a*; they go back to an I. E. stem *sē-zd*, which contracted to *sēd-* even before the separation of the languages. This *sēd-* and one or two others: *ēt-* (Gothic *ēt-um*, Lat. *ēd-imus*) and perhaps *mēn* (Sk. *men-ē*, Irish *domén-ar*) are the types from which the numerous stems in *ē* have developed in the separate languages. For forms like Gothic *hlēf-um*, Latin *cēp-imus*, Sk. *greth-us* (; *granth* ?) cannot be explained as *phonetic* products in the respective languages; they are due to the generalization of the ablaut contained in *sēt-um*: *sat*, etc. Other cases of a similar character could be mentioned; the difficulty, however, lies in the circumstance, that generally when such assumptions are made for remote periods of language, the background of fact, such as lies before us in the case of the type *sēd-* is wanting; there remains then subjective opinion; 'one man's guess is as good as another's'; there is scarcely a difficult form that would resist explanation by this method, and the ground gives way under our feet.

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Notes on the Nalopākhyānam or Tale of Nala, for the Use of Classical Students. By JOHN PEILE, M. A., Fellow and Tutor of Christ's College, Cambridge. Edited for the Syndics of the University Press. 1881.

Any one who has attempted to teach Sanskrit to English-speaking students knows full well how great is the need of a suitable text-book. The announcement in the University Bulletin of Mr. Peile's attempt to supply this need was greeted by us with eager expectation; but his book has filled us with the deepest disappointment.

These Notes are intended to be used either with Jarrett's or Williams's Nala: the former contains the text and vocabulary, all in Roman letters; the latter, the same in Devanāgarī. Mr. Peile's notes are very discursive, but they are often interesting, and his classical comparisons happy. Thus *sabhārya*, which puzzles beginners, is aptly paralleled (page 17) by a hypothetical *ἀνὴρ ἀνάγνωσ*